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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHUNG, JI YONG DAVID	

ART UNIT	PAPER NUMBER
2143	

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/035,806	VARSANO, SHLOMO	
	Examiner	Art Unit	
	Ji-Yong D. Chung	2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 5/7/2005.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-65 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-65 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5/15/2003.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

mc

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1-4, 12-14, 27-30, and 38-40** are ejected under 35 U.S.C. 103(a) as being unpatentable over Walrand et al. (Walrand hereafter) in view of Key et al (Key hereafter).

In reference to **claim 1**, Walrand teaches the method for generating delay value for a network, comprising:

receiving a set of network delay samples [See lines 55-65, column 3. Each node receives packets ("network samples") for monitoring virtual channels];

generating a path delay for a path through the network over a specified time period using the set of network delay samples [See lines 7-10, column 4. Each node has routes each packet from an input port to an output port. Delay information is kept as part of packet data structure, see lines 48-67, column 4.];

generating the service level agreement delay value using the path delay and the confidence interval [See lines 42, column 10, "suitable time period" for which packet is delayed].

Key shows the following limitation, which Walrand does not directly teach:

generating a confidence interval for the path delay using the specified time period, the set of network delay samples, and a confidence level. Key shows the limitation in Figs. 13 and 14. See brief description of the drawings.

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings in Walrand with those of Key, because as stated in Key, from line 65, column 11 to line 2, column 12: "it has *been found helpful* to provide a measure of the confidence that one has in this prediction or estimation," where "prediction" refers to the delay distribution. The significant point is not merely that computed confidence interval is helpful, but that Key shows using standard statistical and digital signal processing techniques to a given set of network samples.

In reference to **claim 2**, Key shows additional technique of *applying a data sieve to the set of network delay samples.* From lines 55, column 8 to line 2, column 2, Key indicates that the sampling rates of the packets can vary; it is applying different sampling rate (or "data sieve") to the delay samples.

In reference to **claim 3**, Walrand shows *the specified time period is a path busy period for the path.* See "Busy Time", Table 1.

In reference to **claim 4**, Walrand teaches:

receiving a time period [See lines 58-62, column 3, for "After a specified period," which indicates that data is collected for a given time period];

generating a first path delay over the time period at a first time point using the set of network delay samples [See lines 7-10, column 4. Each node routes each packet from an input port to an output port. Delay information is kept as part of packet data structure, see lines 48-67, column 4.] and

generating a second path delay over the time period at a second time point using the set of network delay samples [This is a repeat of the step described above, applied to another sample set].

generating the path busy period *by comparing the first path* delay *to the second path* delay [See lines 26-34, column 6. Walrand shows "peak delay" which corresponds to the "busy period" in the instant application. The step is inherent in Walrand; the peak delay can only be computed by comparing the magnitude of delays].

In reference to **claim 12**, its limitations, which are taught by Walrand and Key, and the motivations for combining them have been discussed above with regard to claims 1, 3, and 4.

In reference to **claims 13 and 14**, their limitations have been discussed with respect to claims 2, 4 and claim 12, from which they depend.

Claims 27-30 and 38-40 substantively incorporate all the limitations of claims 1-4 and 12-14, but in apparatus or product form. The reasons for the rejections of claims 1-4 and 12-14 apply to claims 27-30 and 38-40. Therefore, the claims 27-30 and 38-40 are rejected for substantively the same reasons as claims 1-4 and 12-14.

3. **Claims 5, 6, 15, 16, 20-24, 31, 32, 41, 42, 46-49, 52, 53, and 56-65** are rejected under 35 U.S.C. 103(a) as being unpatentable over Walrand and Key as applied to claim 4 above, and further in view of Hughes et al (Hughes hereafter).

In reference to **claim 5**, neither Walrand nor Key shows the additional steps that include:

determining a set of trunks included in the path;

for each trunk in the set of trunks, performing the following:

generating a trunk delay for a trunk over the time period at the time point using the set of network delay samples; and

adding the trunk delay to the path delay.

What Walrand and Key show are related to measurement of delays, but they are not applied to trunks.

Hughes indicates that there are propagation delays associated with trunks. See lines 23-58, column 1. Given Hughes' reference on trunks, it would be obvious to include propagation delays on trunks in addition to link delays.

The motivation for combining Hughes with Walrand and Key is given within Hughes reference, from line 23-43, column, regarding propagation delays. Specifically, he notes that propagation delays (i.e., trunk delays) must be accounted for in order to obtain the accurate overall network delays.

In reference to **claim 6**, its limitations describe the method for computing confidence interval for trunks. Key meets claim 6's limitation, except that it is not directed to trunks:

generating a set of trunk delay *standard deviations from the set of trunks for the specified time period using the set of network delay samples* [Key shows the limitation in Figs. 13 and 14. See brief description of the drawings];

generating a path delay standard deviation using the set of trunk *delay standard deviations* [See from line 65, column 11 to line 3, column 13. Note also that the computational step is inherent in general computation of confidence interval. A confidence interval in Gaussian distribution, for example, is measured in terms of standard deviation, for a specific probability, and therefore, to measure confidence interval, its standard deviation is also computed] and

generating the confidence interval using the path delay standard deviation and the confidence level [See the comments inside the bracket for the preceding limitations]

Trunks and the motivation for combining it have been discussed with respect to claim 5 and Hughes reference.

In reference to **claim 15**, its limitations, which are taught by Hughes, and the motivations for combining them with Walrand and Key, have been discussed above with respect to claim 5 and claim 12, from which it depends.

In reference to **claim 16**, its limitations have been discussed with respect to claim 6 and claim 12, from which it depends.

In reference to **claim 20**, all its limitations, except one, have been discussed with respect to claims 12: it speaks of trunks. Hughes teaches propagation delay associated with trunks. The rationale for the combination is as given for other claims discussed in the current section.

In reference to **claim 21 and 22,** all their limitations, except one, have been discussed with respect to claims 2, 4, and 20, from which they depend.

In reference to **claim 23** all its limitations have been discussed with respect to claims 1, 3, 4, and 6.

In reference to **claim 24**, all its limitations have been discussed with respect to claim 5 and claim 23.

Claims 31, 32, 41, 42, and 46-49 substantively incorporate all the limitations of method claims 5, 6, 15, 16, 20, 22, 23, and 24, but in apparatus or product form. The reasons for the rejections of claims 5, 6, 15, 16, 20, 22, 23, and 24 apply to claims 31, 32, 41, 42, and 46-49. Therefore, claims 31, 32, 41, 42, and 46-49 are rejected for substantively the same reasons as claims 5, 6, 15, 16, 20, 22, 23, and 24.

Claim 52 substantively incorporates all the limitations of method claims 1-4, and 6, but in computer product form. The reasons for the rejections of claims 1-4, and 6 apply to claim 52. Therefore, claim 52 is rejected for substantively the same reasons as claims 1-4 and 6.

Claim 53 substantively incorporates all the limitations of method claims 1-6, but in computer product form. The reasons for the rejections of claims 1-6 apply to claim 53. Therefore, claim 53 is rejected for substantively the same reasons as claims 1-6.

Claims 56 and 57's limitations have been discussed with respect to claims 1-6. Several points are worth noting. Firstly, claim 56 speaks of "storing samples." The "storing" feature is inherent in Walrand; samples must be stored in order to compute the standard deviation as discussed in Walrand. Secondly, claims 56-57 mention "mean delays"; the feature is shown in Table 7, column 2, as "average delay." Thirdly, claim 57 speaks of "averaging." However, the term carries the same meaning in statistics as "mean." Fourthly, Claim 57's method speaks of adding a delay value to the longest delays of two values and repeating the sequence. However, this is the method for determining the busy-period as outlined in claim 4, as applied to trunks. Finally, the claim 57 cites fractions of the given period of time for measuring delays. However, it does not affect the scope of the claim, because any sampling takes time, and therefore duration of sampling of trunk-delays can only be a fraction of the overall sampling duration.

In reference to **claims 58 and 60**, they refer to the duration of sampling and the measurement of real data in a day. There is no particular quality associated with the specifically cited periods of *1 hour* or *1 minute*, in light of the specification. The specified time periods are deemed to be convenient design choice, because they are basic units of time, similar to a second, a day, a week, a month, or a year.

Claim 59 *cites that the path delay for each fraction the given period time derived by averaging the path delays of a sub-fraction of the given period of time.* An average value is always computed by using each sample that *must* have duration and *must* span a sub-fraction of the overall period.

Claim 61 cites that *the transmission delays are sampled at equally spaced times.* In digital signal processing, sampling at equally spaced times is inherent (e.g., Walrand), unless the sampling time itself is a random variable. In the instant case, delay is the random variable; the time of sample transmission is not a random variable.

Claims 62 is directed to *the standard deviation of the particular path is derived by taking the square root of the sum of squares of the standard deviations of the trunks in the particular path.* The limitation is merely a statement of a well-known mathematical formula for computing the standard deviation of the sum of random variables. There is no other way to compute it in the context of the instant application.

Claim 63 cites that *the fractions of the given periods of time partially overlap in a moving window equal to one sub-fraction.* The number of overlapping samples in moving windows is a matter of design choice, for cases in which there is no correlation between overlap duration and delays.

Claim 64 states *the path standard error is the standard deviation for the particular path times a coefficient related the sampling rate transmission delays and a confidence factor.* This is merely a statement of mathematical definition of standard error, as applied to the delay samples.

Claim 65 states that *samples are stored in a three dimensional matrix, where one axis the time of the sample, a second axis is the trunk being sampled, and the third axis is the path between the two points.* How one stores sampled data is design choice. Other storage methods that would work equally well include vectors, associative arrays, 2-D matrices.

4. **Claims 7-9, 33-35, 54, and 55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Walrand and Key, and further in view of Cox.

In reference to **claim 7**, Walrand and Key teach its first four limitations. They have been discussed with respect to claims 1 and 2. Walrand and Key do not show the following two limitations, which Cox shows:

generating a coefficient of variation for the path delay using the path delay *and the* path *standard deviation*; [See from line 57, column 12 to line 63, column 13] and

generating an alert by comparing the coefficient of variation to a threshold coefficient of variation value [lines 26-39, column 11, Cox. Note that alert is generated upon detection of under- or over-utilization, as measured by CV].

Cox does not teach applying CV to delays.

The motivation for combining Cox to Walrand and Key is given by Walrand, which indicates that one aspect of performance ("quality of service") is measured by link delay volatility (i.e., fluctuations) and Cox, which indicates another way to measure volatility of network data is given by CV, in lines 25-63, column 13. It would have been obvious to one of ordinary skill in the art at the time Walrand's invention was made to apply CV to delay, because Cox shows CV also measures volatility.

In reference to **claims 8-9**, their limitations have been discussed with regard to claims 2, 4, and claim 7, from claims 8 and 9 depend.

Claims 33-35 substantively incorporate all the limitations of claims 7-9, but in apparatus or product form. The reasons for the rejections of claims 7-9 apply to claims 33-35. Therefore, claims 33-35 are rejected for substantively the same reasons as claims 7-9.

Claim 54 substantively incorporates all the limitations of method claims 1-4 and 7, but in computer product form. The reasons for the rejections of claims 1-4, and 7 apply to claim 54. Therefore, claim 54 is rejected for substantively the same reasons as claims 1-4 and 7.

Claim 55 substantively incorporates all the limitations of method claims 1-5 and 7, but in computer product form. The reasons for the rejections of claims 1-5 and 7 apply to claim 55. Therefore, claim 55 is rejected for substantively the same reasons as claims 1-5 and 7.

5. **Claims 10, 11, 17-19, 25, 26, 36, 37, 43-45, 50, and 51** are rejected under 35 U.S.C. 103(a) as being unpatentable over Walrand, Key, and Cox as applied to claim 9 above, and further in view of Hughes.

In reference to **claim 10**, its limitations, which are taught by Hughes, and the motivations for combining them with Walrand, Key, and Cox have been discussed above with regard to claim 5 and claim 9, from which it depends.

In reference to **claim 11**, its limitations, which are taught by Hughes, and the motivations for combining them with Walrand, Key, and Cox have been discussed above with regard to claim 6 and claim 10, from which it depends.

In reference to **claim 17**, its limitations have been discussed with regard to claim 6 and claim 7.

In reference **to claim 18**, its limitations have been discussed with regard to claim 2 and claim 17, from which it depends.

In reference to **claim 19**, all its limitations, except one, have been discussed with respect to claim 4 and claim 17. Claim 19 lays out the process of identifying busy period, but for trunks. The fact that it deals with trunks do not change the rationale of the rejections laid out the discussion of claims 4 and 17, as the elements of the claims are still met by the references.

In reference to **claim 25** all its limitations have been discussed with respect to claims 1-4, 6, and 7.

In reference to **claim 26**, all its limitations have been discussed with respect to claim 5 and claim 25.

Claims 36, 37, 43-45, 50, and 51 substantively incorporate all the limitations of claims 10, 11, 17-19, 25 and 26, but in apparatus or product form. The reasons for the rejections of claims 10, 11, 17-19, 25 and 26 apply to claims 36, 37, 43-45, 50, and 51. Therefore, claims 36, 37, 43-45, 50, and 51 are rejected for substantively the same reasons as claims 10, 11, 17-19, 25 and 26.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ji-Yong D. Chung whose telephone number is (571) 272-7988. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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